

## Behavioral Interventions in the Treatment of Pathological Gambling: A Review of Activity Scheduling and Desensitization

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### Abstract

Cognitive and behavioral interventions have been cautiously recommended as “best practice” in the treatment of pathological gambling. Behavioral interventions, using a range of techniques, have been the most commonly evaluated approach to the psychological treatment of pathological gambling. The recent literature evaluating behavioral treatments has shifted from aversive therapy to alternative behavioral techniques such as interventions based on desensitization and exposure procedures. A range of other behavioral techniques, such as alternative activity scheduling, problem solving training, financial planning and limit setting, social skills training, and relapse prevention, have been included as treatment components of standardized cognitive-behavioral programs. This paper reviews the published empirical literature investigating the efficacy of the behavioral intervention strategies of activity scheduling and desensitization in the treatment of pathological gambling. Although the findings for both intervention strategies are promising, they must be interpreted with caution given the methodological difficulties inherent in the pathological gambling treatment outcome literature.

*Keywords:* gambling, pathological gambling, activity scheduling, behavioral activation, desensitization, exposure, behavior therapy.

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### Introduction

The higher availability of legalised gambling opportunities in most western countries has generally stimulated higher rates of gambling participation and problem gambling activity in these countries (Productivity Commission, 1999). The prevalence of problem gambling behavior in various communities has been studied extensively in the US, UK, and Australia. The Californian Prevalence study found prevalence of lifetime problem or pathological gambling in California to be 3.7% (Volberg, Nysse-Carris, & Gerstein, 2006). The 2007 British Gambling Prevalence Survey found that 0.5% of the adult population had a gambling problem in the previous 12 months (Wardle et al., 2007). In Australia, the Productivity Commission (1999) national study of gambling found that the prevalence of problem gambling approximates to 2.1 per cent of the community. Pathological gambling is defined in the Diagnostic and Statistical Manual of Mental Disorders (Fourth Edition, Text Revision) (DSM-IV-TR) as “a persistent and recurrent maladaptive gambling behavior that disrupts personal, family or vocational pursuits” (American Psychiatric Association [APA], 2000, p. 671). Classified as an impulse control disorder, the diagnosis is characterised by preoccupation with gambling, repeated unsuccessful efforts to control gambling, gambling as a way of escaping from problems, chasing losses (i.e., the effort to win back lost money), deception about the extent of involvement with gambling, and committing illegal acts to finance gambling (APA, 2000). Pathological gambling has been associated with significant financial consequences, psychological and social impairment, and health difficulties (Productivity Commission, 1999; National Research Council, 1999) and is now recognised as a significant public and mental health problem (Shaffer & Korn, 2002).

Various theoretical models attempt to account for the acquisition and maintenance of pathological gambling. Among the most comprehensive of these models is that offered by Sharpe (2002), which adopts a diathesis-stress perspective, whereby particular life circumstances are instrumental in stimulating loss of control. This model proposes that a genetic vulnerability to pathological gambling can be conferred through biological changes in neurotransmitters or through psychological traits such as impulsivity, and that this genetic vulnerability is likely to be compounded by early experiences that result in a psychological vulnerability in the form of positive gambling attitudes, impulsivity, and poor coping skills. It is postulated that membership in gambling subcultures and a pattern of early wins combine to

produce a perceptual filter through which wins and losses are interpreted in maladaptive ways, and that these factors contribute to the development of cognitive biases, and to the association between gambling and arousal. The model argues that as the frequency of gambling increases, the association between gambling, cognitive biases, and arousal becomes more automatic. According to the model offered by Sharpe, electronic gambling machine gamblers begin to gamble to escape from life problems and the high levels of arousal associated with stress are reinterpreted as excitement within the gambling environment. In contrast, horse race and/or casino gamblers gamble to replace the low levels of arousal associated with boredom with an optimal level of arousal in the form of excitement. Accordingly, internal states (e.g., boredom and stress) and external triggers (e.g., gambling-related stimuli) act to elicit an automatic response of increased autonomic arousal accompanied by gambling-related cognitions. The arousal and cognitions combine to produce a physiological state, which constitutes an urge. It is postulated that the probability of gambling is determined by the availability of effective coping skills, and that the combination of cognitive biases and autonomic arousal result in continued gambling, regardless of whether the gambler is winning or losing. It is argued that continued play is therefore mediated by level of arousal, degree of cognitive bias, and availability of coping strategies, and that problems consequent to the gambling behavior serve to maintain problem gambling by contributing to disturbed mood, high levels of arousal, and lower availability of coping resources.

Although such theories for pathological gambling appear to have some empirical support, the evaluation of psychological interventions for pathological gambling is limited and is only recently establishing even basic methodologies. A recent review indicated that although there has been improvement in the evidence base for pathological gambling treatment in recent years, no treatment satisfies the current standards for evidence of efficacy (Westphal, 2007a, 2007b). Despite these considerations, the literature investigating the efficacy of psychological interventions for pathological gambling provides some limited evidence that this disorder is amenable to psychological treatment, with approximate overall success rates for psychological treatments estimated at 70% at six months follow-up, 50% at one-year follow-up, and 30% at two-year follow-up (López Viets & Miller, 1997; Walker, 1992). These improvements in gambling behavior are also often associated with notable improvements in psychological functioning (López Viets & Miller, 1997). A recent meta-analysis revealed that psychological treatments were more effective than no treatment at post-treatment and follow-up, and that the magnitude of effect sizes were lower in studies including clients with a diagnosis of pathological gambling and higher in randomized controlled trials, within subjects designs and in studies trialling programs with a higher number of therapy sessions (Pallesen, Mitsem, Kvale, Johnsen, & Molde, 2005).

A number of psychological interventions have been described for treating pathological gambling, including psychodynamic interventions, Gamblers Anonymous, inpatient rehabilitation programs, behavioral interventions, cognitive interventions, and cognitive-behavioral interventions (Jackson, Thomas, & Blaszczynski, 2003). It has been argued that the treatment outcome literature does not provide a strong basis for differentiation of the available treatment options (National Centre for Education and Training on Addiction [NCETA], 2000) and that the treatment outcome literature is still attempting to address the issue of whether therapy is effective, rather than the degree of effectiveness, or which therapies are most effective (Ladouceur et al., 2003). However, cognitive and behavioral models, which have been particularly influential in the theoretical explanation of pathological gambling, have resulted in the most extensive treatment outcome literature relative to other etiological formulations. Moreover, all of the available methodologically robust studies have been conducted using cognitive and behavioral techniques. Given the infancy of the gambling treatment outcome literature, this improved methodology coupled with the consistency of findings allows the generation of cautious service delivery recommendations regarding these treatment approaches as 'best practice' for the treatment of pathological gambling (Jackson et al., 2003; López Viets & Miller, 1997; NCETA, 2000; Westphal, 2007a).

Behavioral interventions, using a range of techniques, have been the most common approach to the psychological treatment of pathological gambling. In accordance with learning principles, behavioral approaches to the treatment of pathological gambling have commonly applied classical and operant conditioning techniques in order to reduce the arousal and excitement associated with gambling. The earliest form of behavioral treatment reported in the literature is aversive therapy, which is based on the assumption that gambling can be unlearned through classical conditioning (Blaszczynski, 1985). Aversive therapy involves the subject experiencing unpleasant stimulation, usually in the form of electric shock, while engaging in some aspect of gambling behavior (Walker, 1992). Many studies have evaluated aversive techniques either in isolation (Barker & Miller, 1968; Goorney, 1968; Koller, 1972; McConaghy, Armstrong, Blaszczynski, & Allcock, 1983; McConaghy, Blaszczynski, & Frankova, 1991; Salzmann, 1982), or in combination with other behavioral procedures such as supportive therapy, covert sensitization, positive reinforcement, exposure techniques, and stimulus control techniques (Cotler, 1971; Greenberg & Marks, 1982; Greenberg & Rankin, 1982; Seager, 1970). Although these studies indicate that aversive therapy, both alone and in combination with other techniques, generally produce moderate improvements in gambling behavior, it is argued that it is difficult to ethically justify the use of a procedure that has been criticised as an intrusive, unpleasant, and dehumanising procedure that causes undue emotional distress (Blaszczynski, 1985; NCETA, 2000).

For this reason, literature evaluating behavioral treatment shifted from aversive therapy to alternative behavioral techniques such as behavioral counselling (Dickerson & Weeks, 1979; Rankin, 1982), imaginal relaxation (McConaghy, Armstrong, Blaszczynski, & Allcock, 1988; McConaghy et al., 1991), and desensitization and exposure techniques (Blaszczynski, Drobny, & Steel, 2005; Echeburúa, Báez, & Fernández-Montalvo, 1996; Echeburúa & Fernández-Montalvo, 2002; Echeburúa, Fernández-Montalvo, & Báez, 2000; Kraft, 1970; McConaghy, 1991; McConaghy et al., 1983, 1988, 1991; Symes & Nicki, 1997; Tolchard, Thomas, & Battersby, 2006). Behavioral techniques that have been employed as treatment components of standardised treatment programs for pathological gambling include alternative activity planning, problem solving training, financial planning and limit setting, social skills and communication training, relapse prevention, stimulus control, in-vivo exposure, and imaginal desensitization (Bujold, Ladouceur, Sylvain, & Boisvert, 1994; Dowling, Smith, & Thomas, 2006, 2007; Ladouceur, Boisvert, & Dumont, 1994; Milton, Crino, Hunt, & Prosser, 2002; Petry et al., 2006; Sharpe & Tarrier, 1992; Sylvain, Ladouceur, & Boisvert, 1997; Tolchard & Battersby, 2000).

This invited paper for the *International Journal of Behavioral Consultation and Therapy* will review the empirical research on the intervention strategies of activity scheduling and desensitization in the treatment of pathological gambling.

### **Activity Scheduling in the Treatment of Pathological Gambling**

It has been argued that it is during leisure that personally destructive activities such as pathological gambling occur (Leitner & Leitner, 2005). Pathological gamblers tend to participate in few recreational activities other than gambling as their gambling behavior becomes all consuming (Petry, 2005; Jackson et al., 1997; Jackson, Thomason, Ryan, & Smith, 1996). They often consider that gambling is the only pleasurable activity in which they participate (Petry, 2005), and have minimal social contact with others (Bergh & Kühlhorn, 1994). Moreover, a reduction in gambling behavior during recovery attempts often results in pathological gamblers experiencing a substantial amount of unstructured time (Hodgins, 2001; Hodgins & el-Guebaly, 2000; Walters, 1994).

It is generally agreed that pathological gamblers must fill this spare time with productive activity (Walters, 1994) and that they can promote their physical and psychological well-being by participating in leisure activities (Petry, 2005). Participation in non-gambling activities may also enhance the development of a non-gambling social support network (Petry, 2005). It has therefore been suggested that

pathological gamblers will benefit from the identification and participation in alternative leisure activities to replace gambling behaviors, whereby effective substitution of the gambling behavior involves the identification of hobbies and leisure activities tailored to the individual and the development of a network of supportive non-gambling relationships (Dowling et al., 2006; Petry et al., 2006; Walters, 1994).

These arguments are supported by evidence from the literature examining the recovery process for pathological gambling. Hodgins (Hodgins, 2001; Hodgins & el-Guebaly, 2000) has found that the primary change strategy reported by recovered gamblers is stimulus control (i.e., curtailing exposure to gambling opportunities and cues) but that the second most common change strategy was the development of activities incompatible with gambling. In recognition of the time-consuming nature of problematic gambling behavior, recovered gamblers reported that they specifically planned to fill the time by engaging in alternative activities, such as starting an exercise program, taking on a new work project, and spending more time reading or with family.

In behavioral terms, a reduction in the positive reinforcement derived from not participating in pleasant activities results in a downward spiral in which the individual experiences even fewer positive reinforcers (Persons, Davidson, & Tompkins, 2001). Activity scheduling interventions (e.g., activity scheduling, pleasant activity scheduling, and behavioral activation) are interventions that were developed in response to the literature indicating that there is a significant relationship between mood and pleasant activities and that depressed individuals are less likely to engage in pleasant activities and experience positive reinforcement than non-depressed individuals (Cuijpers, van Straten, & Warmerdam, 2007; Dimidjian et al., 2006; Hopko, Lejuez, Ruggiero, & Eifert, 2003; Persons et al., 2001). Activation strategies typically include self-monitoring of daily activities, structuring and scheduling daily activities, rating the degree of pleasure and mastery experienced during engagement in specific daily activities, exploring alternative behaviours related to achieving goals, and planning ahead for potential obstacles (for step-by-step protocols, see Lejuez, Hopko, & Hopko, 2001 and Persons et al., 2001). Activity scheduling interventions typically attempt to optimize the chances of success by involving graded task assignments to assist in breaking down large, challenging tasks into smaller, more realistic tasks (Hopko, Lejuez, LePage, et al., 2003; Persons et al., 2001). In selecting activities, there is often a particular emphasis on activities that will enhance positive interactions with their environment, such as pleasant activities, mastery activities, and social interactions (Cuijpers et al., 2007; Hopko, Lejuez, LePage, et al., 2003; Persons et al., 2001). In addition to increasing positive reinforcement, activity scheduling interventions are often also placed within a cognitive framework, whereby it is argued that the interventions serve to provide direct evidence to challenge maladaptive cognitions (see Hopko, Lejuez, Ruggiero, et al., 2003 for a discussion of the change processes involved in activity scheduling interventions). While activity scheduling treatments can be employed as sole interventions, they are often included as a key component of cognitive-behavioural treatment programs (Persons et al., 2001). Although originally developed for the treatment of depression, there is evidence that activity scheduling interventions are effective in the treatment of a range of disorders (Cuijpers et al., 2007; Hopko, Lejuez, LePage, et al., 2003).

Despite its demonstrated efficacy with a range of other disorders, activity scheduling has not been extensively examined in the treatment of pathological gambling. However, it has been employed as a supplemental technique in several studies examining the efficacy of cognitive-behavioral treatment programs (Bujold et al., 1994; Dowling et al., 2006, 2007; Ladouceur et al., 1994; Petry et al., 2006; Sharpe & Tarrier, 1992; Sylvain et al., 1997). These studies are described in Table 1.

**Table 1 Activity Scheduling as Component of Cognitive-Behavioral Treatment Program**

Study	Treatment description	No. of sessions	N	Type of study	Follow-up period (mths)	Outcomes
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Sharpe & Tarrier (1992)	Stabilization (financial limit setting, avoidance of gambling-related stimuli, alternative behavioral repertoires), awareness (self-monitoring, rationale), applied relaxation training, imaginal exposure, in-vivo exposure, cognitive restructuring	Unknown	1	Case study	Un-known	Reduced gambling behavior and anxiety
Bujold et al. (1994)	Cognitive correction, problem solving training (incl. financial planning & alternative activity planning, social skills training, relapse prevention	Treated until gambling ceased & an 'adequate' perception of chance developed	3	Multiple baseline	9	Improvement on multiple indices of gambling behaviour
Ladouceur et al. (1997)			4	Multiple baseline	6	Abstinence at follow-up evaluation
Sylvain et al. (1997)			29	Comp-arative	12	Improvement on multiple indices of gambling behaviour
Petry et al. (2006)	Discovering triggers, functional analysis, increasing pleasant activity, self-management planning, coping with urges, assertiveness training, changing irrational thinking, coping with lapses	8	231	Comp-arative	12	CB treatment reduced gambling relative to GA referral alone; clinically significant improvements
Dowling et al. (2006)	Financial limit setting, alternative activity planning, cognitive correction, problem solving, communication training, relapse prevention, imaginal desensitization	12		Comp-arative	6	Significant improvement on gambling behaviour and psychological functioning
Dowling et al. (2007)			56	Comp-arative	6	Group treatment failed to produce superior outcomes to control group on several measures

For example, the 12-session cognitive-behavioral treatment program developed by Dowling and colleagues (Dowling et al., 2006, 2007) for female pathological gamblers with electronic gaming machine gambling problems comprised modules on financial limit setting, alternative activity planning, cognitive correction, problem solving, communication training, relapse prevention, and imaginal desensitization. The alternative activity planning component of this intervention program comprised one session requiring the identification and participation in alternative leisure activities to replace gambling behaviors, with an emphasis on inexpensive, pleasurable, or social activities. The program employed a pleasurable activities list to identify possible alternative leisure activities and participants were required to schedule the replacement activities into daily life in order to structure their time and to achieve a routine. This session required participants to identify barriers to participating in these activities and to begin implementing these activities into their daily lives. In a study designed to address the fundamental issue of whether cognitive-behavioral treatment is effective for female pathological gamblers, Dowling et al. (2006) found that by the completion of the six-month follow-up period, participants treated with the program displayed significant improvement on gambling behavior and psychological functioning measures and that 89% of participants no longer met diagnostic criteria for pathological gambling. In a study designed to determine

the differential efficacy of the program delivered in an individual and group format, Dowling et al. (2007) found that group treatment failed to produce superior outcomes to the control group in relation to several measures of psychological functioning and that by the completion of the six-month follow-up period, 92% of the gamblers allocated to individual treatment compared with 60% allocated to the group treatment no longer satisfied the diagnostic criteria for pathological gambling.

Petry (Petry, 2005; Petry et al., 2006) also developed a cognitive-behavioral program for the treatment of pathological gambling that includes an intervention component designed to increase pleasant activities. This 8-session program comprises discovering triggers, functional analysis, increasing pleasant activities, self-management planning, coping with urges to gambling, assertiveness training and gambling refusal skills, changing irrational thinking, and coping with lapses. In the session designed to establish other hobbies or recreational activities (Petry, 2005), treatment-seeking pathological gamblers are presented with a "leisure checklist" that contains a list of more than 50 activities or hobbies, with an emphasis on free, inexpensive, solo, and social activities. Using this list, pathological gamblers identify activities in which they once liked to participate or in which they would consider trying to participate, and are encouraged to attempt and record several of these activities in the upcoming week. Activities are also planned for high-risk times and pre-commitment strategies, such as telephoning a friend to arrange meeting for a coffee during the session, are employed to enhance the likelihood that the pathological gambler will participate in the leisure activity. A randomised evaluation of the cognitive-behavioral treatment program designed by Petry indicated that the treatment reduced gambling relative to Gamblers Anonymous referral alone during the treatment period and resulted in clinically significant improvements, with some effects maintained throughout the 12 month follow-up period (Petry et al., 2006).

Petry (2005, p. 239) provides a case study illustrating this session of the program. The client in the case study (p. 12), Mary, is a 53-year-old divorced woman with three grown children who recently lost her job. Although Mary's social activities used to consist of spending time with family members, she was less available to her children since she started gambling at the casino. In the session designed to increase her pleasant activities, Mary identified "sewing, reading, watching sporting events, gardening, spending time with children, arts and crafts, movies, theatre, eating out, journaling, travel, and church" as appealing on the leisure checklist. Mary selected attending her grandson's soccer game as an activity in which she could participate during the following week. Mary identified "sewing, reading, gardening, and journaling" as activities that she could participate in spontaneously and without preparation. There was a need, however, to find some alternative activities as she did not have some of the materials she required at home and did not have any money. Mary identified going to dinner at an old friend's house as a planned activity. Mary was encouraged to record at least one pleasant activity that she participated in each day.

Taken together, the findings of these studies evaluating cognitive-behavioral programs indicate that the combination of several techniques is effective in the treatment of pathological gambling. However, interventions that are comprised of a combination of therapeutic components make it difficult to elucidate their relative contribution (Bujold et al., 1984; Jackson et al., 2003; López Viets & Miller, 1997; NCETA, 2000). Given the relatively uncomplicated, time-efficient, and cost-effective nature of activity scheduling (Cuijpers et al., 2007; Hopko, Lejuez, LePage, et al., 2003; Lejuez et al., 2001), the field may benefit from further research designed to determine the degree to which this approach is effective as a sole therapy in treating pathological gambling using measures that directly evaluate change in activity engagement.

The efficacy of interventions related to activity scheduling and behavioral activation, such as leisure counseling, a helping process designed to facilitate maximal leisure wellbeing, in the treatment of pathological gambling have also yet to be explored (Leitner & Leitner, 2005). The therapeutic-remedial approach to leisure counseling is a direct and in-depth approach most appropriate for individuals with specific leisure-related behavioral problems, such as problematic gambling behavior. This approach

examines leisure attitudes and self-concept, coping skills, behavioral problems and impairments, and support systems. Some important objectives of the therapeutic-remedial approaches to leisure counseling are 1) identification of leisure-related behavioral problems and their causes; 2) identification of the desired changes in leisure attitudes and behavior to alleviate the behavioral problems; 3) development of an individualized program of recreational activities that will facilitate the integration into leisure living in the community, 4) initiation of involvement in activities, with supervision; and 5) development of community contacts that will enable the client to participate in community activities without supervision. This approach has the potential to be implemented as a therapeutic technique in the treatment of pathological gambling.

### Desensitization in the Treatment of Pathological Gambling

Desensitization and exposure techniques, which are based on the principles of classical conditioning, aim to modify the conditioned response of arousal or excitement by pairing the stimulus cues for gambling with no gambling or a competing response such as boredom or relaxation (Walker, 1992). Desensitization in the treatment of pathological gambling has comprised both imaginal procedures (Blaszczynski et al., 2005; McConaghy, 1991; McConaghy et al., 1983, 1988, 1991), in-vivo procedures (Echeburúa et al., 1996, 2000; Echeburúa & Fernández-Montalvo, 2002; Greenberg & Rankin, 1982; McConaghy et al., 1991; Symes & Nicki, 1997), and gradual (systematic) procedures involving both imaginal and in-vivo gambling-related cues (Greenberg & Marks, 1982; Tolchard et al., 2006). In-vivo desensitization involves real cues for gambling, while imaginal desensitization involves imagined cues for gambling (Walker, 1992). Exposure to the gambling cues either in-vivo or in imagination, followed by response prevention or relaxation until the urge is reduced, results in deconditioning of the stimulus cues for gambling and the gambling urge (Tolchard et al., 2006).

The studies investigating the efficacy of desensitization and exposure techniques in the treatment of pathological gambling are described in Table 2. Although this literature has typically relied on case studies or small uncontrolled designs (Echeburúa & Fernández-Montalvo, 2002; Greenberg & Marks, 1982; Greenberg & Rankin, 1982; Kraft, 1970; McConaghy, 1991; Symes & Nicki, 1997; Tolchard et al., 2006), there is emerging evidence of their efficacy using larger samples, controlled designs, or comparative designs (Blaszczynski et al., 2005; Echeburúa et al., 1996, 2000; McConaghy et al., 1983, 1988, 1991).

**Table 2: Desensitization and Exposure Interventions**

Study	Treatment description	No. of sessions	N	Type of study	Follow-up period (mths)	Outcomes
Kraft (1970)	Systematic desensitization + relaxation induced by hypnosis or methohexitone sodium	Unknown	1	Case study	12	'No change'
Greenberg & Marks (1982)	Gradual exposure (imaginal + in-vivo), covert sensitization, aversive therapy	Unknown	5	Case study	6	Results 'unimpressive'; gambling 'unresponsive' condition
Greenberg &	Gradual in-vivo	Average	26	Non-	Average	Five 'maintained'

Rankin (1982)	exposure, aversive therapy, & covert sensitization	of 6 sessions (range of 1-25)		comp-arative	of 8.5 (range 0-2.5 years)	control' over their gambling, 7 'lapsed intermittently', and remainder gambling
McConaghy et al. (1983)	Imaginal desensitization (inpatient)	14 sessions over 5 days	20	Comp-arative	12	Reduction: imaginal desensitization (70%), aversive therapy (30%)
McConaghy et al. (1988)	Imaginal desensitization (inpatient)	14 sessions over 5 days	20	Comp-arative	12	Reduction: imaginal desensitization (50%), imaginal relaxation (70%)
McConaghy et al. (1991)	Imaginal desensitization (inpatient)	14 sessions over 5 days		Comp-arative	24-108	Cessation or control: imaginal desensitization (78%), aversive therapy (33%), imaginal relaxation (57%), in-vivo exposure (60%)
McConaghy (1991)	Imaginal desensitization (inpatient)	14 sessions over 5 days	1	Case study	12	'Unstable' recovery
Echeburúa et al. (1996)	Individual stimulus control and gradual in-vivo exposure with response prevention	6	64	Comp-arative	12	Abstinence or only 1-2 episodes: 69% for individual exposure compared with 38% for group cognitive & combined treatment
Symes & Nicki (1997)	Gradual in-vivo cue-exposure with response prevention	Unknown (69 days)	2	Case study	0	Abstinence period of one-month as final outcome
Echeburúa et al. (2000)	Individual stimulus control and gradual in-vivo exposure with response prevention (initial treatment) <i>then</i> individual versus group relapse prevention	Unknown	69	Comp-arative	12	All subjects gave up gambling after receiving initial treatment; both relapse prevention groups higher rates of abstinence than control group
Echeburúa & Fernández-Montalvo (2002)	Stimulus control, gradual in-vivo exposure with response prevention, & relapse prevention	9	1	Case study	12	Improvement in multiple gambling and psychological measures
Blaszczynski et	Home-based imaginal	1	47	Non-	2	Significant

al. (2005)	desensitization			comp- arative		reduction in multiple gambling and psychological measures; control or cessation in 79%
Tolchard et al. (2006)	Graded exposure (imaginal + in-vivo) with response prevention	1	1	Case study	6	Significant reduction in gambling behaviour, urge intensity and frequency

McConaghy and colleagues (McConaghy et al., 1983, 1988, 1991) conducted a series of comparative outcome studies evaluating imaginal desensitization as a cue-exposure technique in the treatment of pathological gambling. These studies were designed to test the validity of the behavioral completion mechanism (BCM) hypothesis advanced by McConaghy (1980). This drive-reduction theory posits that avoidance or reduction of aversive physiological states acts as reinforcement for gambling behavior and that a BCM is established in the cortex when a behavior is habitually performed. When a compulsive behavior such as gambling is stimulated (e.g., by gambling-related situations) but not actually completed either through internal or external prevention, the BCM produces increases in arousal and subjective tension. This tension becomes noxious and sufficiently aversive for the subject to be compelled to complete the behavior to its conclusion. The rationale proposed by McConaghy (1980) was that the imaginal desensitization procedure would allow pathological gamblers to control their gambling behaviors by reducing their general level of arousal so the BCM could no longer provoke such an uncontrollable state of tension.

The imaginal desensitization procedure employed by McConaghy and colleagues requires pathological gamblers to provide detailed scenes that stimulate gambling responses, but in which they leave without gambling. A typical scene is:

*“You have had a stressful day where nothing has gone right for you. You feel tense and angry. On the way home you decide to drive to the casino to play the slot machines. As you are walking toward the entrance of the casino you start to feel bored with the idea of spending your time and money gambling. You decide not to enter, but turn around and decide to return home without having gambled.”* (Blaszczynski et al., 2005, p. 16).

In the imaginal desensitization procedure, pathological gamblers are trained in a brief progressive muscle relaxation procedure, and maintain that state of relaxation while visualising themselves performing the behaviors in the scenes. Pathological gamblers are asked to recall specific feelings of arousal and emotions while visualising these scenes. When relaxation is achieved, therapy proceeds to another scene and the process is repeated. Approximately four scenes are administered within each 20-minute session. It is argued that a minimum of ten 20-minute sessions is required to achieve a therapeutic result (Blaszczynski et al., 2005). Interestingly, the scenes are not placed in a hierarchical sequence of increasing arousal levels as would occur in systematic desensitization (Walker, 1992).

The studies conducted by McConaghy and colleagues applied a standard inpatient treatment protocol in which pathological gamblers in each comparative group received fourteen 20-minute treatment sessions over a five-day period. The first study in this series compared the imaginal desensitization procedure with aversive therapy for 20 predominantly male pathological gamblers (McConaghy et al., 1983), while the second report compared imaginal desensitization with imaginal relaxation for 20 predominantly male pathological gamblers (McConaghy et al., 1988). McConaghy and

colleagues (1991) further extended this treatment protocol to produce a comprehensive systematic treatment outcome study for predominantly male pathological gamblers comparing imaginal desensitization with other behavioral procedures, including aversive therapy (electric shocks to the fingers after reading a series of phrases describing their gambling), imaginal relaxation (visualisation of relaxing images without reference to previous gambling situations), and in-vivo exposure (observation of customary gambling situation with therapist). The two to nine year follow-up evaluation provided an indication of gambling behavior in the month prior to evaluation. Cessation or control was reported by 78% of the pathological gamblers who received imaginal desensitization ( $n = 33$ ), 33% of the pathological gamblers who received aversive therapy ( $n = 6$ ), 57% of the pathological gamblers who received imaginal relaxation ( $n = 14$ ), and 60% of the pathological gamblers who received in-vivo exposure ( $n = 10$ ). This series of reports concluded that the BCM hypothesis of pathological gambling is supported by the apparent superiority of the imaginal desensitization procedure (McConaghy et al., 1983, 1988, 1991).

The most recent evaluation of imaginal desensitization was conducted in 2005 in a pre-post design with 47 pathological gamblers receiving a pre-recorded audiotape version of the imaginal desensitization procedure that was designed for use at home (Blaszczynski et al., 2005) rather than an inpatient setting. In this study, treatment involved only one session that provided pathological gamblers with a copy of a pre-recorded audiocassette with two 20-minute imaginal desensitization set, and a set of printed instructions for use at home. Different imaginal desensitization scenes were available for electronic gaming machine gamblers and horse bettors. Pathological gamblers were instructed to practice the imaginal desensitization procedure three times per day for five days, with sessions held two to three hours apart. The findings indicated that significant improvements in urge ratings, preoccupation, perceived self-control over gambling, indices of actual gambling behavior, depression, anxiety, and impulsivity were achieved at 2 months following treatment. Nearly half (49%) of the sample reported abstinence and a further 30% reported controlled or markedly reduced gambling. The findings of this study demonstrate that home-based imaginal desensitization can be a cost-effective intervention for pathological gambling.

Researchers have also applied in-vivo exposure procedures with response prevention in the management of pathological gambling (Echeburúa et al., 1996, 2000, 2002; Greenberg & Rankin, 1982; McConaghy et al., 1991; Symes & Nicki, 1997). In a controlled evaluation, Echeburúa et al. (1996) compared the efficacy of individual stimulus control and gradual in-vivo exposure with response prevention, group cognitive therapy, and a combination of the two therapies (combined). Gradual in-vivo exposure with response prevention and stimulus control was designed to face the craving for gambling and to increase expectations of self-effectiveness regarding the capacity to control gambling. The individual in-vivo exposure with response prevention and stimulus control and group cognitive modalities required participants to attend weekly sessions conducted over a six-week period on an outpatient basis, while the combined treatment required participants to attend bi-weekly sessions over the same treatment period. Therapeutic success was stringently defined as abstinence or the occurrence of only one or two episodes of gambling during the 12 months following treatment completion, provided the amount of money spent was no greater than a week's worth of gambling prior to treatment. The 12-month follow-up evaluation revealed success rates of 69% for the individual in-vivo exposure with response prevention and stimulus control treatment, 38% for the group cognitive treatment, and 38% for the combined treatment. Thus, at the 12-month follow-up, the individual in-vivo exposure with response prevention and stimulus control treatment produced superior results to the group cognitive and combined treatments, which produced comparable results. Although this study is confounded in the specific investigation into the efficacy of behavioral and cognitive treatment strategies as the treatment groups also differed in terms of individual and group format, it suggests that in-vivo exposure is an effective approach in the treatment of pathological gambling.

Only a small number of reports describe interventions based on gradual exposure with response prevention, in which pathological gamblers are exposed to increasingly arousing imaginal and in-vivo gambling-related cues (Greenberg & Marks, 1982; Tolchard & Battersby, 2000; Tolchard et al., 2006). The use of single-session graded exposure comprising both in-vivo and imaginal procedures has been evaluated in a recent repeated measures single-case experimental study (Tolchard et al., 2006). The client was a 50-year old female pathological gambler with a three-year history of problematic electronic gaming machine gambling. Treatment involved attendance with her sister who was to act as co-therapist in the later stages of treatment. The single session comprised a series of five stages that involved gradual exposure: 1) imaginal exposure of being in a gaming venue, 2) walking to a gaming venue, 3) standing immediately outside the gaming room, 4) sitting in the gaming room within clear sight of the machines, and 5) a final stage culminating in the client being in the gaming room alone with money. Each stage was terminated on stabilization of urge rating and reduction in urge rating by at least 50% from the maximum level triggered by the stimulus. The client continued to practice the final step of exposure in the live setting on completion of the session. A six-month follow-up evaluation revealed a significant reduction in client-rated gambling severity, urge frequency and intensity, psychological symptoms, and depression. Although this appears to be a promising cost-effective intervention for the treatment of pathological gambling, the intervention may only be successfully applied to clients with relatively moderate gambling problems with low rates of comorbid conditions (Tolchard et al., 2006). Further research evaluating this graded and cost-effective intervention using a controlled and randomized design is necessary.

Taken together, the findings of the literature evaluating activity scheduling and interventions based on desensitization are promising. However, it remains unclear as to whether these interventions are more effective than other procedures as the validity of the findings is generally compromised by methodological considerations that make it difficult to elucidate the relative efficacy of the various approaches. For example, it is difficult to compare the treatment outcomes of therapies across studies that have variable follow-up evaluation periods, diversity in outcome measures of excessive gambling or associated difficulties, different definitions of outcome (e.g., definitions of 'treatment success', 'abstinence', and 'control') (e.g., Jackson et al., 2003; Walker, 2005; Walker et al., 2006). It is also difficult to compare findings for studies that only report outcomes for treatment completers as there are generally high and variable rates of attrition in the literature (Walker, 2005; Westphal, 2007a, 2007b). Walker (2005) argues that these are major methodological problems that must be overcome before strong statements about the relative efficacy of interventions for pathological gambling can be validly asserted. Recommendations for designing outcome studies and frameworks for reporting outcomes in treatment research have recently been published (e.g., Walker, 2005; Walker et al., 2006). It is evident that rigorous and comprehensive scientific research taking these recommendations into consideration is required to fully establish the efficacy of behavioral techniques such as activity scheduling and desensitization in the treatment of pathological gambling.

## Conclusion

In a limited literature characterised by methodological limitations, evaluations of behavioural treatments for pathological gambling are the most extensive and methodologically sound relative to other techniques. However, behavioural techniques such as alternative activity scheduling procedures are often employed as treatment components of standardised cognitive-behavioural intervention programs. Although it is generally agreed that pathological gamblers will benefit from the identification and participation in alternative leisure activities to replace gambling behaviours, the relative contribution of activity scheduling in the treatment of pathological gambling is difficult to elucidate. The pathological gambling treatment outcome literature may benefit from an evaluation of the sole application of activity scheduling or leisure counselling, a helping process designed to facilitate maximal leisure well-being. In contrast, behavioural techniques such as desensitization and exposure procedures have been evaluated as separate treatment modalities in managing pathological gambling behaviour. Although the early literature

focussed on the efficacy of imaginal desensitization, more recent literature has emphasised the application of in-vivo or gradual exposure procedures with response prevention. Importantly, researchers are now attempting to design cost-effective interventions based on desensitization procedures (Blaszczynski et al., 2005; Tolchard et al., 2006). Although the findings are promising, it remains unclear as to whether these interventions are more effective than other procedures given methodological considerations that make it difficult to elucidate the relative efficacy of different approaches. Further research evaluating these interventions using controlled and randomised designs is required.

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